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# NASA Procedural Requirements

**NPR 8715.7**

Effective Date: May 30, 2008

Expiration Date: May 30,  
2013**COMPLIANCE IS MANDATORY**[Printable Format \(PDF\)](#)

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 (NASA Only)

## **Subject: Expendable Launch Vehicle Payload Safety Program**

**Responsible Office: Office of Safety and Mission Assurance**[| TOC](#) | [Preface](#) | [Chapter1](#) | [Chapter2](#) | [AppendixA](#) | [AppendixB](#) | [AppendixC](#) | [ALL](#) |

## **Chapter 1. Program Overview**

### **1.1 Introduction**

NASA ELV payloads often incorporate hazards which can pose significant risk to life and property. NASA ELV payload missions require the coordination of efforts among a diverse group of participants who have varying responsibilities and authorities. These missions can present unique challenges to the payload safety assurance process, which often involves numerous organizations internal and external to the Agency. The OSMA has established the NASA ELV Payload Safety Program to assist ELV payload projects in achieving safety design objectives and obtaining the necessary safety approvals and to assure that NASA safety policy is satisfied for all ELV payload missions. This chapter contains NASA's ELV Payload Safety Policy and identifies the general roles, responsibilities, and requirements of the NASA ELV Payload Safety Program.

### **1.2 ELV Payload Safety Policy**

*Note: NPR 8715.3, NASA General Safety Program Requirements, Chapter 3, contains safety policy applicable to all types of payloads controlled by NASA. The following is consistent with that general Agency policy.*

It is NASA policy to safeguard people and resources (including flight hardware and facilities) from hazards associated with ELV payloads and hazards associated with payload to launch vehicle integration, multiple payloads, and payload-related GSE by eliminating the hazards or reducing the risk associated with each hazard to an acceptable level. To accomplish this, it is NASA policy to:

- a. Establish and maintain technical and procedural safety requirements applicable to the design, production, prelaunch processing and testing, vehicle integration, launch, and planned recovery of NASA ELV payloads.
- b. Coordinate with U.S. or foreign entities that participate in NASA ELV payload projects as needed to identify and ensure compliance with agreed-to safety requirements that apply to each payload.

*Note: The requirements of this NPR (including requirements incorporated by reference) apply to all NASA ELV payloads. Most NASA ELV payloads are launched through the NASA Launch Services Program. Special cases may include NASA payload launches on Department of Defense or foreign launch vehicles. The requirements tailoring process defined in this NPR is designed to address typical NASA missions as well as special cases (see paragraph 1.4 of this NPR).*

- c. Incorporate all applicable safety requirements into the overall requirements for each NASA ELV payload, the contracts for any related procurements, and any related cooperative or grant agreements.

*Note: It is the intent of this NPR to ensure adherence to applicable safety requirements that provide an equivalent level of safety for all NASA ELV payloads, other resources, and personnel regardless of where the payload is being processed, including commercial facilities.*

d. Maintain an independent payload safety review and approval process designed to ensure that each NASA ELV payload project properly implements all applicable safety requirements and to facilitate safety risk management appropriate to each payload.

### 1.3 Roles and Responsibilities

#### 1.3.1 The Chief, Safety and Mission Assurance shall:

- a. Oversee and provide funding for administration of the NASA ELV Payload Safety Program ([Requirement 57547](#)).
- b. Approve and promulgate Agency-level ELV payload safety policy and requirements, including the provisions of this NPR and associated implementation documents ([Requirement 57548](#)).
- c. Designate (or assure the flow-down of) SMA Technical Authority per NPR 7120.5 as applicable to ELV payload missions and the requirements of this NPR ([Requirement 57549](#)).

*Note: For most NASA ELV payload projects, there is an SMA Technical Authority with overall SMA responsibility for the project who would generally be located within the responsible Center SMA organization. There is also an SMA Technical Authority with responsibility for the launch area processing activities, who is generally the SMA Technical Authority for ELV launches conducted under the NASA Launch Services Program. It is possible for a safety issue to overlap two areas of SMA responsibility. In this case, both SMA Technical Authorities would participate in resolving the issue.*

- d. Designate, in writing, the NASA ELV Payload Safety Manager (see paragraph 1.3.3 of this NPR) ([Requirement 57551](#)).
- e. Designate, in writing, the members of the ELV Payload Safety Agency Team (see paragraph 1.3.4 of this NPR) ([Requirement 57552](#)).
- f. Resolve any conflicts within the ELV payload safety process requiring an Agency-level decision ([Requirement 57553](#)).

#### 1.3.2 Each SMA Technical Authority responsible for a payload shall:

- a. Approve tailoring of safety requirements per paragraph 1.4 of this NPR ([Requirement 57555](#)).
- b. Concur on waivers to safety requirements per paragraph 1.5 of this NPR ([Requirement 57556](#)).

*Note: The Technical Authorities for Engineering and Health and Medical will also be involved in the tailoring and waiver processes as applicable.*

#### 1.3.3 The NASA ELV Payload Safety Manager shall:

- a. Lead the NASA ELV Payload Safety Program and serve as the Agency focal point for matters involving ELV payload safety ([Requirement 57559](#)).
- b. Develop and maintain Agency-level ELV payload safety policy and requirements ([Requirement 57560](#)).
- c. Maintain the safety review and approval process for NASA ELV payloads ([Requirement 57561](#)).

*Note: The ELV Payload Safety Review and Approval Process is defined in Chapter 2 of this NPR. The NASA ELV Payload Safety Manager's responsibilities specific to the process are provided in paragraph 2.3.6 of this NPR.*

- d. Provide input and guidance to NASA officials responsible for development of ELV payload-related contracts, grants, and cooperative agreements with entities internal and external to NASA, including foreign entities ([Requirement 57563](#)).
- e. Report to the NASA Headquarters OSMA on any ELV payload safety concern requiring an Agency-level decision ([Requirement 57564](#)).
- f. Participate as an element of the NASA Headquarters Safety and Mission Assurance Audits, Reviews, and Assessments program defined by NPR 8705.6 for the area of ELV payload safety ([Requirement 57565](#)).
- (1) Participate in appropriate assessments of payload safety processes at NASA Centers, component and range facilities, payload processing facilities (including contractor facilities used to process NASA ELV payloads), and launch sites ([Requirement 57566](#)).
- (2) Coordinate independent assessments of payload safety processes with the audits, reviews, and assessments performed by the OSMA to ensure an effective and efficient overall safety assessment process ([Requirement 57567](#)).
- g. Open or further enhance communications regarding NASA ELV payload safety with U.S. and foreign entities and

document partnerships, joint activities, and special arrangements through formal agreements ( [Requirement 57568](#)).

h. Ensure that safety review activities and actions are coordinated with the ELV Payload Safety Agency Team, NASA Centers, ELV payload projects, launch vehicle contractors, and appropriate approving authorities (including the SMA Technical Authority when appropriate) to resolve payload safety concerns in support of overall mission success ( [Requirement 57569](#)).

i. Establish and maintain an ELV payload safety training program addressing NASA ELV payload safety requirements, safety review and approval process, and related activities ( [Requirement 57570](#)).

j. Provide a forum for payload safety technical interchange and lessons learned to include educational conferences and workshops for the benefit of the ELV payload community ( [Requirement 57571](#)).

k. Track and implement lessons learned for continuous improvement of the safety review process and update policy, processes, and requirements as needed ( [Requirement 57572](#)).

l. Develop and maintain a NASA ELV Payload Safety Program Web site as a tool that may be used by ELV payload projects and other involved organizations to provide access to applicable documents, schedules, notices of special events, and other project and ELV Payload Safety Program information ( [Requirement 57573](#)).

m. Develop, track, document, and report metrics data on the success of the ELV Payload Safety Program and develop recommendations for continuous improvement and areas of emphasis ( [Requirement 57574](#)).

n. Ensure appropriate agreements exist with Air Force Range Safety and other external organizations for their participation in ELV Payload Safety Program activities ( [Requirement 57575](#)).

o. Lead the NASA ELV Payload Safety Agency Team (Agency Team):

(1) Establish and document the activities and processes needed for the Agency Team to satisfy the responsibilities identified in paragraph 1.3.4 of this NPR ( [Requirement 57577](#)).

(2) Ensure decisions have been coordinated with all Agency Team members ( [Requirement 57578](#)).

p. For projects existing as of the effective date of this NPR, coordinate with the Payload Project Manager and others as appropriate to determine the applicability of this NPR to the remaining phases of the project (see paragraph 2.3.1.n. of this NPR) ( [Requirement 57579](#)).

#### 1.3.4 The ELV Payload Safety Agency Team

The Agency Team is an element of the OSMA and functions to provide Agency-wide perspective and insight on ELV payload safety-related activities in support of the SMA Technical Authority. The Agency Team members shall:

a. Independently assess ELV Payload Projects to assure that the policy and requirements of this NPR (including requirements incorporated by reference) are consistently implemented throughout the Agency ( [Requirement 57581](#)).

b. Remain cognizant of payload safety concerns and disseminate related information to applicable payload projects ( [Requirement 57582](#)).

c. Coordinate Agency Team positions regarding any concerns, guidance, or comments applicable to a payload project and provide those positions to the project's Payload Safety Working Group (PSWG) (see paragraph 2.2 of this NPR) as early as possible in the safety review process ( [Requirement 57583](#)).

d. Provide guidance on ELV payload safety concerns to the Chief, Safety and Mission Assurance and the SMA Technical Authorities, including any issues requiring an Agency-level decision ( [Requirement 57584](#)).

e. Provide consistent interpretation of safety requirements (including determination of requirements applicability) and provide guidance on the proper implementation of safety requirements ( [Requirement 57585](#)).

f. Issue interim guidance to the NASA ELV payload community on safety requirements, processes, and specific payload design concerns as needed to assure the policy and requirements of this NPR are satisfied ( [Requirement 57586](#)).

g. Provide the SMA Technical Authorities with assessments of alternative approaches proposed as part of tailoring and waivers of requirements (see paragraphs 1.4 and 1.5 of this NPR) ( [Requirement 57587](#)).

h. When making a project-specific decision, coordinate with any other organization that shares safety responsibility for the mission to arrive at a mutually acceptable approach ( [Requirement 57588](#)).

#### 1.3.5 Each Center Director responsible for a Payload, Payload Processing Facility, or Launch Site (or designee) shall:

a. Establish the Center-level processes and associated requirements needed to ensure that the policy in paragraph 1.2 of this NPR is satisfied for each ELV payload project that uses the Center's resources ( [Requirement 57590](#)).

- b. Support safety assessments of ELV payload activities and respond to all findings and recommendations for which the Center is responsible ( [Requirement 57591](#) ).
- c. Ensure that those who have responsibilities defined in this NPR complete the training on the NASA ELV payload safety requirements, safety review and approval process, and related activities ( [Requirement 57592](#) ).

*Note: The ELV Payload Safety Manager is responsible for developing an ELV payload Safety training program per paragraph 1.3.3.i of this NPR.*

- d. Ensure that Center institutional resources (including any GSE and facilities) provided to the payload project to support the processing, testing, vehicle integration, launch, and planned recovery activities of NASA ELV payloads comply with applicable NASA and Center technical and procedural requirements ( [Requirement 57594](#) ).

1.3.6 Each Center Safety and Mission Assurance Director responsible for a Payload, Payload Processing Facility, or Launch Site (or designee) shall:

- a. Ensure implementation of this NPR for each ELV payload project that uses the Center's resources ( [Requirement 57596](#) ).
- b. Provide each payload project with safety engineering, safety analysis, and other safety expertise needed to ensure the project successfully completes the safety review and approval process defined in Chapter 2 of this NPR ( [Requirement 57597](#) ).
- c. Ensure that processes exist and assessments are conducted to ensure compliance with this NPR and the safety of activities within the scope of their authority ( [Requirement 57598](#) ).

1.3.7 NASA Contract, Grant, Cooperative Agreement, or Other Agreement Officers shall ensure that all applicable safety and mission assurance requirements are incorporated into the contracts and agreement(s) governing each payload, including compliance with this NPR, NPR 8715.3, NPR 1800.1, Federal, State, and local requirements, and compliance with and using NPR 5800.1, Grant and Cooperative Agreement Handbook for grants ( [Requirement 57599](#) ).

## 1.4 Tailoring Process

1.4.1 The overall intent of the ELV payload safety requirements tailoring process is to ensure appropriate oversight of Agency requirements while providing the Centers and project managers with the authority and flexibility needed to accomplish their tasks. For the purposes of the ELV payload safety process, tailoring is defined as the process of assessing the applicability of safety requirements within this NPR and other documents applicable to a payload project and evaluating the project's potential implementation in order to generate a set of specific safety requirements for the project.

1.4.2 The Payload Project Office and the payload project system safety engineer shall work with the PSWG to identify applicable requirements and to tailor a set of mission-specific safety requirements that are compiled into a mission-specific document (see paragraph 2.5.2 of this NPR for the required content of the tailored requirements document) ( [Requirement 57602](#) ).

1.4.3 The PSWG Chairperson (see paragraph 2.3.4 of this NPR) and Agency Team shall coordinate to ensure consistent application of tailoring throughout the Agency ( [Requirement 57603](#) ).

1.4.4 The PSWG Chairperson and the ELV Payload Safety Manager shall coordinate to ensure that authorities involved in the mission or having responsibility for issues addressed by the tailoring, approve (sign) each tailored requirements document or provide equivalent written approval ( [Requirement 57604](#) ).

1.4.5 The signatories of each tailored requirements document shall include, but are not limited to, the Payload Project Manager and responsible NASA Technical Authority(ies) (SMA, Engineering, and Health and Medical, as applicable) ( [Requirement 57605](#) ).

1.4.6 The Payload Project Office shall ensure that the tailored requirements document is completed and approved in accordance with paragraph 2.4 of this NPR ( [Requirement 57606](#) ).

1.4.7 After approval, any further changes to the tailored requirements document must be documented and distributed as a "change page" by the Payload Project Office for coordination and approval/concurrence by the original authorities ( [Requirement 57607](#) ).

1.4.8 If the tailoring of a requirement (i.e., deletion of a requirement, a change to a requirement, or an approach that differs from the stated requirement) results in an increased safety risk, the Payload Project Office shall prepare a waiver request per paragraph 1.5 of this NPR ( [Requirement 57608](#) ).

*Note: An approach that differs from the stated requirement may be approved as part of the tailored requirements document provided it does not result in increased safety risk and the document contains sufficient rationale.*

1.4.9 In the event that an authority does not concur on a tailored requirements document and the issue cannot be resolved through coordination with the PSWG, the Agency Team, or the SMA Technical Authority(ies), all interested parties shall brief their position to the Chief, Safety and Mission Assurance to identify the best approach to achieve resolution ([Requirement 57610](#)).

## 1.5 Waiver Process

1.5.1 The following implements NPR 8715.3 requirements for processing waivers as they apply to NASA (Agency-level) ELV payload safety requirements. For the purpose of this NPR, a waiver is defined as a written authorization granting relief from an applicable requirement and documenting the acceptance of any associated safety risk.

*Note: The waiver terminology and process defined in this NPR are consistent with that of the launch range and payload processing community generally involved in NASA ELV payload missions. This consistency is considered essential to allow clear communication and resolution of waiver issues with the ELV payload community, which includes numerous organizations internal and external to NASA. There may be other Agency policy and terminology related to waivers that are exclusively internal to NASA. The ELV Payload Safety Program remains cognizant of NASA policy related to waivers and works with the payload projects and PSWGs to resolve any implementation concerns. In general, the Tailoring Process, coupled with the Waiver Process (defined by paragraphs 1.4 and 1.5 of this NPR), meet the overall intent of NASA policy to provide for appropriate oversight of Agency safety requirements while allowing the flexibility to accept reasonable risks necessary to accomplish ELV payload missions.*

1.5.2 Each Payload Project Manager or designee shall coordinate with their mission PSWG as soon as the project identifies a potential noncompliance with a safety requirement ([Requirement 57614](#)).

1.5.3 The Payload Project Manager or designee shall draft the waiver request ([Requirement 57615](#)).

Note: The NASA ELV Payload Safety Manager maintains the latest waiver request format and makes it available to all PSWGs.

1.5.4 The Payload Project Manager or designee shall coordinate each waiver request with the PSWG and the Agency Team to:

- a. Ensure the waiver request and accompanying data are correct and complete ([Requirement 57618](#)).
- b. Ensure any risk is properly characterized and that any increase in overall risk is identified ([Requirement 57619](#)).
- c. Assess any effects the waiver might have on other projects, resources, or requirements ([Requirement 57620](#)).
- d. Ensure appropriate signatures for approval, concurrence, and risk acceptance per the requirements of NPR 8715.3 ([Requirement 57621](#)).

1.5.5 In addition to satisfying the requirements of NPR 8715.3, the signatories of each waiver shall include the Payload Project Manager, responsible NASA Technical Authority(ies) (SMA, Engineering, and Health and Medical as applicable), and other authorities involved in the mission or having responsibility for issues addressed by the waiver ([Requirement 57622](#)).

1.5.6 The ELV Payload Safety Manager shall coordinate with the Agency Team and each PSWG Chairperson to ensure a consistent waiver approach for all NASA ELV Payloads ([Requirement 57623](#)).

1.5.7 In the event that a required signatory does not concur or approve a waiver and the issue cannot be resolved through coordination with the PSWG, the Agency Team, or the SMA Technical Authority(ies), all interested parties shall brief their position to the Chief, Safety and Mission Assurance to identify the best approach to achieve resolution ([Requirement 57624](#)).

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